EffCoBuild

ENERGY EFFICIENCY COMMUNITIES –

ESTABLISHING PILOT COMMUNITIES FOR THE BUILDING SECTOR

WP6 –IMPLEMENTATION PLAN FOR PILOT PROJECTS – MUNICIPALITY JESENICE (SLOVENIA) - FINAL

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The final list of measures proposed in EffCoBuild project for the municipality Jesenice is presented in the Table 1. According to the work programme defined in WP6 at least one of the measures will be implemented in during the lifetime of this project, while the others will be lounched in the frame of the project and their implementation phase will go beyond the official conclusion of the EIE project.

Table 1: Final concept of measures for the community Jesenice

	Description of measure	Priority
1	Municipal subsidies	
1.1	Progressive municipal subsidies for EE refurbishment projects of big energy consumers in the municipality	1
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Legend:
Priority 1 – implemented in WP6
Priority 2 – highly recommended, idea launched during EffCoBuild project lifetime
Priority 3 – to be further developed after the project

2. IMPLEMENTATION PLAN - FINAL

2.1. General

Based on the communication at the national level (workshops with key actors) and based on the international consultation with project partners the final plan for the implementation of the concept of measures was done.

Some measures were selected to be implemented in the frame of the WP6 since they represent the effort of cross-linking the various activities already going on in Slovenia and in the municipality Jesenice (Table 1, priority 1). These measures are web-site benchmarking and various dissemination activities.

The other activities will be launched according to the scope and work programme of the project, what will create the good starting point for further activities after the end of the projects. (Table 1, Priority 2) These measures are information and training of building managers.

One selected measure (energy performance contracting) has lower priority but they are expected to become more interesting with the growing interest for energy renovation projects also supported by EffCoBuild we-site benchmarking (Table 1, Priority 3).

2.2. Time Schedule – implementation of a pilot project - FINAL

Table 2: Time schedule of measures in community Jesenice

	Description of measure	Schedule									
	Year	**2006**				**2007**				**2008**	
	Measure / Quartier	**I**	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**	**I**	**II**
1.1	Progressive municipal subsidies for EE refurbishment projects of big energy consumers in the municipality										
2.1	Energy performance contracting in apartment buildings - preparatory activities – not selected for implementation in WP6										
3.1	Information and awareness raising of building managers – not selected for impl.ntation in WP6										
3.2	Training of building managers– not selected for implementation in WP6										
4.1	Web site benchmarking of delivered energy for 40 apartment buildings connected to d.h.										
4.2	Ranking of 40 apartment buildings by energy saving potential – big potential, average, already refurbished cases										
4.3	Pilot energy certificate for 40 apartment buildings										
4.4	IR thermography for 40 apartment buildings										
4.5	Recommended measures										
4.6	Sharing actual information on financing opportunities, subsidies, soft loans										
4.7	Energy advisory network ENSVET – cross linking										
5.1	10 best practice cases from EffCoBuild brochure and uses' opinion available on-line										
6.1	EIE EI-Education, EIE Passive Retrofit Kit , EIE SHARE – target:: building managers, building owners, users of flats in social housing										
7.1	Dissemination of web site information to district heating clients (over the energy bills)										
7.2	Dissemination of web site benchmarking via media										

Legend:
- Priority 1 – implemented in WP6
- Priority 2 – highly recommended, idea launched during EffCoBuild project lifetime
- Priority 3 – to be further developed after the project

3. DETAILED DESCRIPTION OF PILOT PROJECT - JESENICE

3.1. Progressive municipal subsidies

Municipality Jesenice developed »150 subsidy programme« of subsidizing energy efficiency measures and installation of alternative energy systems in existing buildings in municipality. The program started in 2000. The incentives were eligible for all existing buildings with energy consumption for space heating over 150 kWh/m2 a.

The main conclusion of the subsidy scheme was that there was not enough projects subsidized and that the biggest energy consumers in the municipality were still not reached in spite of the financial support offered.

The suggestion was to extend the municipal programme in terms of budget and in terms of subsidised measures, like restoration of the heating system and installation of heat metering and billing according to the actual energy consumption. Already executed projects of metering and billing instantly showed a significant drop in energy consumption, not due to reduced thermal comfort, but mainly due to better habits of the user.

The common opinion of the key actors in the municipality was that besides other support in identification and preparation of EE refurbishment project there is additional challenge to overcome the biggest barrier – the lack of money for investment – by increasing the offered percentage of subsidy for the top energy consumers.

In practice the biggest energy consumers are apartment buildings from 60-ties, with low insulation, insufficient maintenance, used by low income (retired, unemployed) owners and/ or tenants. Co-financing 30% of investment in combination with national subsidies and soft loans should enable the financing of the measure even in the described conditions.

It is planned to enlarge the budget for subsidies in 2007 and to accept the criteria for progressive subsidy scheme. The measure was confirmed in discussion with actors at national workshop 1 - EffCoBuild.

Table 3: Progressive muncipal subsidies, budget allocated in 2007 – 40.000 EUR

Energy consumption kWh/m2 year	Subsidy for RUE and RES investment %
150 - 180	10 – 15
180 – 210	15 – 20
210 – 230	20 – 25
> 230	30

Eligible measures

- thermal insulation of attics (unused attic) or thermal insulation of roofs (used attic),
- thermal insulation and renewal of façades,
- thermal insulation of basement ceilings or flooring,
- replacement of buildings' joinery – windows and doors,
- switch to district heating (connection to hot-water network and gas grid),
- installation of heat pumps for hot water generation,
- installation of solar systems for hot water generation,
- installation of special wood-fuelled combustion plants for central heating running on logs (biomass).

Detailed schedule

Date	Activity	Actors
December 2007	Municipal budget with allocated money for subsidies for building refurbishment accepted (200 applications are expected in 2008)	Municipal counce-lors, district heating
2008	Effcobuild support to municipal subsides by web site benchmarking of inefficienc buildings	Building manager, energy advisors, building owners /users, consultants

3.2. Web-site benchmarking

"Web-site benchmarking" is an umbrella name for a set of measures using internet for communication with the target group: building owners (incl users, tenants) and/ or building managers in order to stimulate the EE renovation projects in building sector in Jesenice and to facilitate the use of available municipal co-financing instruments and other national supporting instruments.

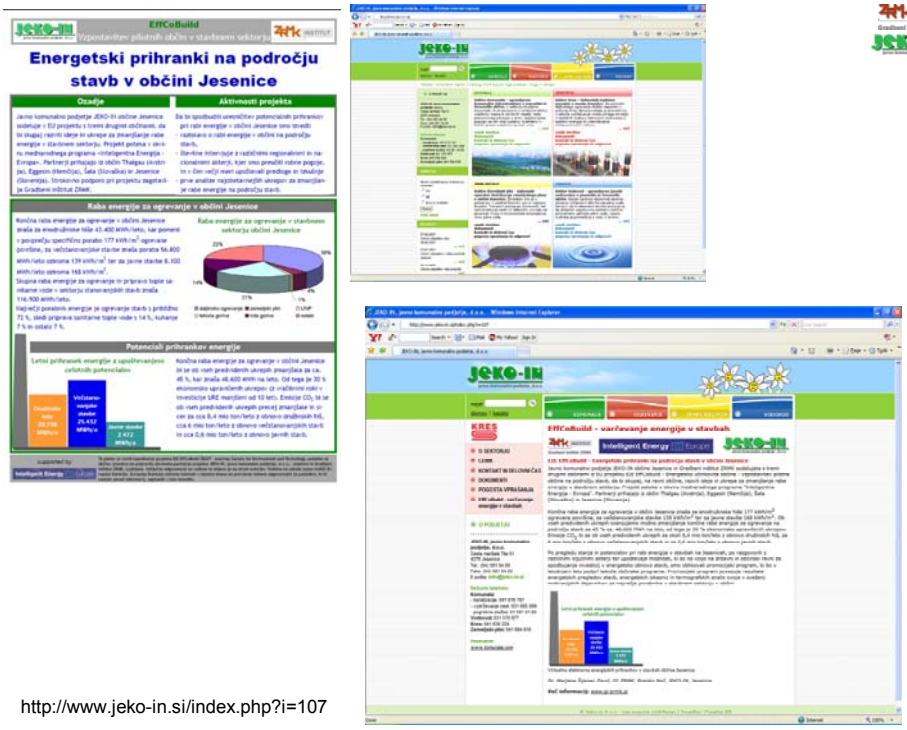
Currently the biggest problem is to build a refurbishment project, i.e. to move from the identified energy saving potential to actual decision for the implementation of the meas-ure. Internet was considered to be a powerful tool to bring the general information about the actual energy use, the actual building condition, the energy saving potential to the relevant target group (building managers, building owners, ESCOs, technology suppliers and building contractors). Communication with key actors over a home page of municipal d.h. company JEKO-IN also allows to promote new EPBD instruments (energy certificate), available financial incentives, energy advisory options; as well as it is possible to dissemi-nate the useful results of other EIE projects in the field of municipalities, social housing, energy certificates and passive house renovation.

The main elements for presentation on the internet.

- Communication with end users & building managers
- http://www.jeko-in.si
- about EIE EffCoBuild project
- FAQ about heating and energy savings

- Promotion of measures in support to “RUE in over 150 kWh/m2 buildings”
- List of 40 buildings,
- ranking by energy consumption,
- energy performance certificate,
- IR themography,
- RUE measures identified (energy audit),
- Best practice in restoration
- Financing opportunities, further advice options

Building condition can be easily demonstrated with IR thermography, the methodology for energy certificate is almost completed (EIE BUDI project), some buildings have been evaluated by energy audits. Putting this information on the web site would stimulate the owners to raise questions towards EE investments, to look for energy advice (free of charge ENSVET scheme is available in the municipality) and to prepare a feasible EE refurbishment project.



http://www.jeko-in.si/index.php?i=107

Figure 1. EffCoBuild part of JEKO-IN homepage (http://www.jeko-in.si)

Detailed schedule

Date	Activity	Actors
Nov. 2007	Agreement with JEKO-IN about the detailed contend of web site benchmarking	ZRMK, JEKO-IN
Dec. 2008	Discussion with external expert elaborating the web site at JEKO-IN site, Detailed development of web site content;	ZRMK, JEKO-IN, external expert;

	Working on energy certificated, IR thermograohy, collection of existing info on buildings, normalisation of data for the web iste	BCEI ZRMK
2008	Effcobuild support to municipal subsides by web site benchmarking of inefficienc buildings Active promotion of the EffCoBuild web site with on like energy benchamarking - in media and at workshop	Building manager, energy advisors, building owners /users, consultants BCEI ZRMK, JEKO-IN

3.2.1. Web-site benchmarking of delivered energy for 40 apartment buildings

Web site benchmarking of delivered energy for 40 big apartment buildings in centre of Jesenice, connected to d.h. and considered as big energy consumers in the heating season 1998/99 due to delivered energy above 150 kWh/m2a, is planned. The data will be available on the EffCoBuild page on JEKO-IN homepage. JEKO_IN as a municipal utility can provide updated data on energy consumption which can be compared with the data for some recent years and with the almost 10 years old information on energy consumption. The specific energy indicators can be compared also with indicators of other buildings in the municipality.The measure is planned to be implemented in WP6.

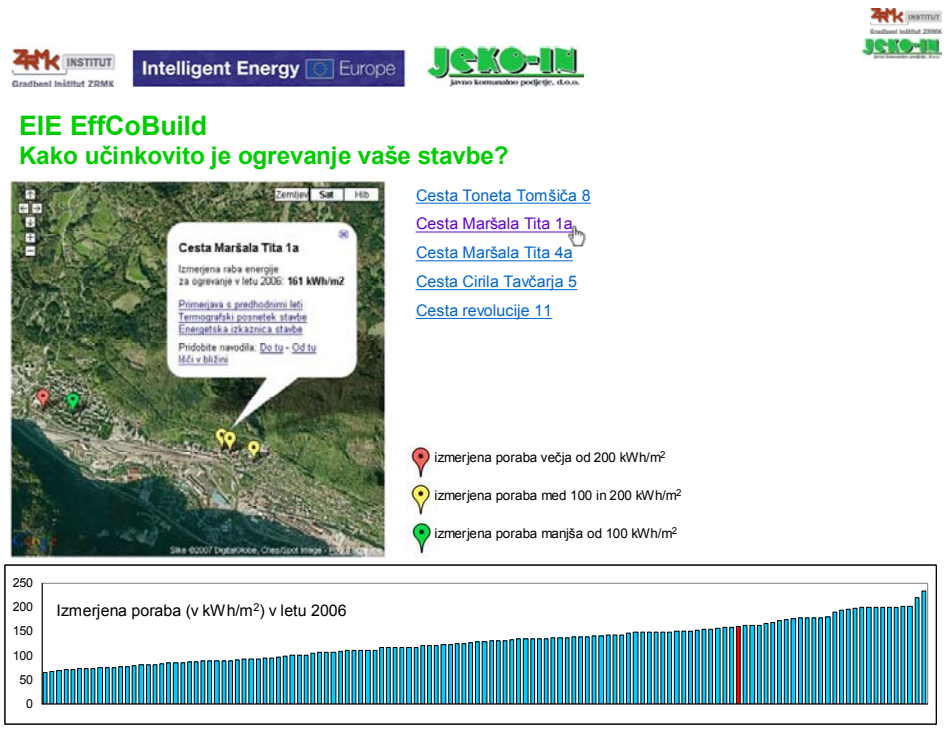


Figure 2. Benchmarking of energy indicators in buildings connected to district heating in Jesenice (130 connected bldgs, 40 big energy consumers).

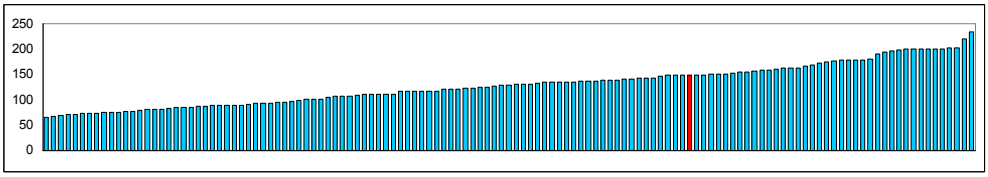


Figure 3. Benchmarking of energy indicators in buildings connected to district heating in Jesenice.

3.2.2. Ranking of buildings by energy saving potential

The measure aims at ranking of 40 apartment buildings big energy consumers by energy saving potential. The selection of building originates from almost ten years ago when municipality Jesenice finance the energy audit for them. Since that time some buildings already implemented renovation measures while the other remained the same. Based on this follow up activity the key actors can be informed about the saving potential and the impact of the implemented measures. The graphical presentation on the map is planned with indicated ranking by red colour – for big potential, yellow colour – for average condition, green colour – for good buildings, already refurbished in recent years. Further information on energy use can be obtained by clicking on the selected building on the map.

The aim of the measure is information and awareness raising and further deployment of successful renovation cases. The measure is planned to be implemented in WP6.

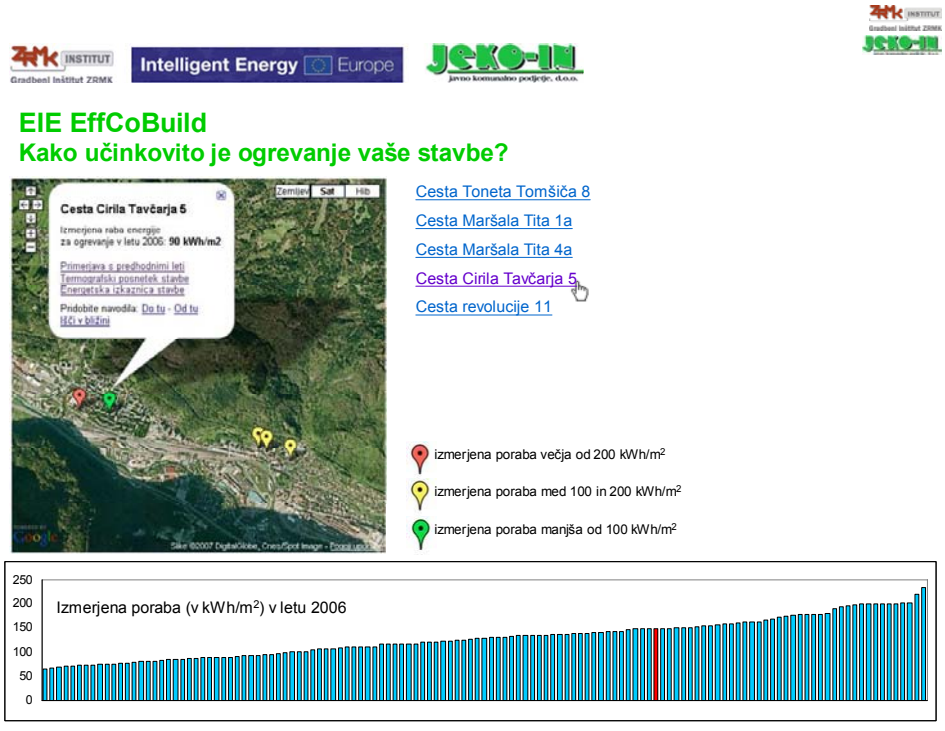


Figure 4. Draft benchmarking site

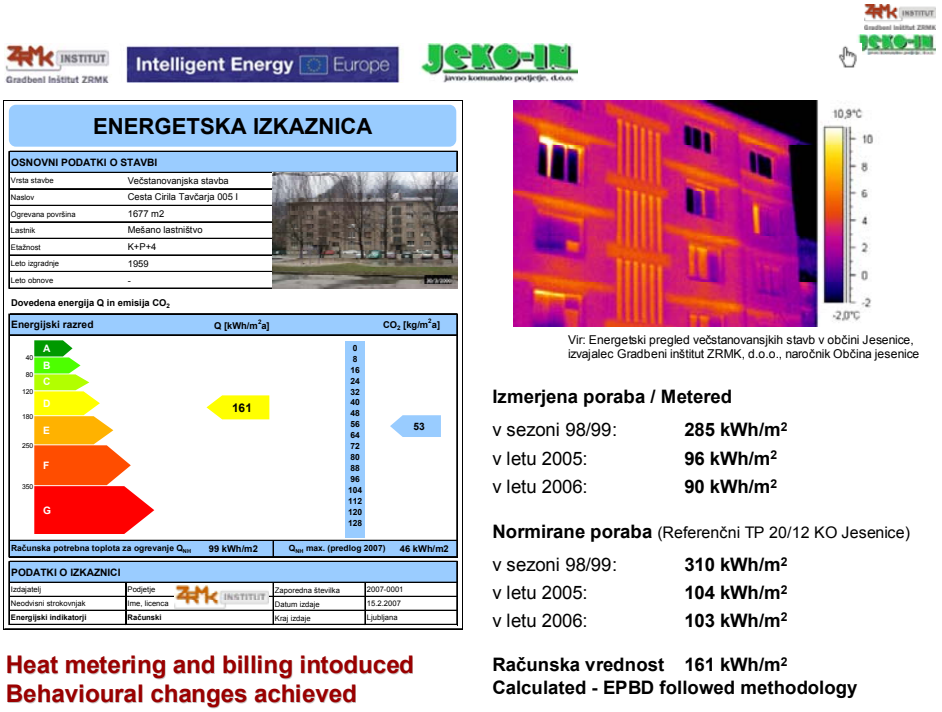


Figure 5. Energy saving potential for the web site including energy performance certificate.

3.2.3. Pilot energy performance certificate

EPBD imposed the requirement for obligatory energy certificate of buildings. For the time being energy certificate is in the process of transposition in the national regulation, the final scheme is not available for the time being. But in order to support the market uptake of the certificate the pilot projects (EIE BUDI) with the tentative certification scheme is available in Slovenia.

This measure focuses on elaboration of 40 pilot energy certificates according to new EPBD calculation methodology. Pilot energy certificates will be elaborated and put on the web page in order to complement the benchmarking of actual energy consumption data and to make people aware of the new coming instrument to promote energy efficient building.

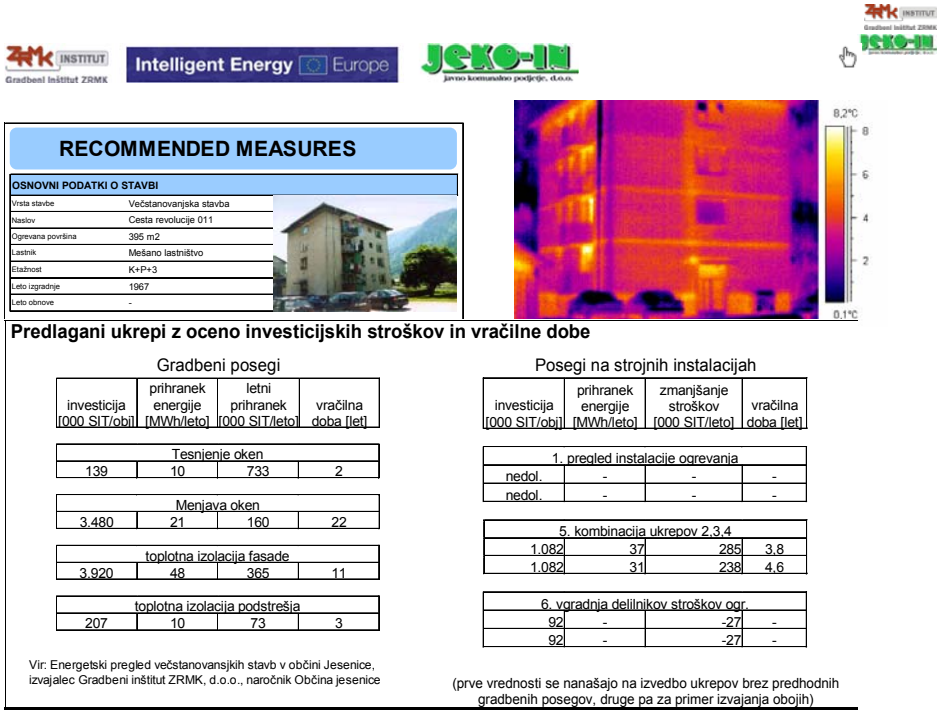
3.2.4. Thermographic pictures on-line

IR thermographic pictures have already been elaborated for most of the 40 apartment buildings - big energy consumers in the frame of energy audit and partly during EffCoBuild project. Since IR thermography is a very attractive visual presentation of the building condition it was concluded to check again the compliance of the existing IR pictures, repeat thermography when needed due to already implemented measures and put the IR pictures on the internet. Usually this approach has a strong impact on building owners and building managers when they consider the energy renovation of the building.

3.2.5. Recommended measures

Based on the study of energy saving potential in building sector in municipality (in WP2) and based on specific results from existing energy audit for selected apartment buildings

in Jesenice, generic recommended measures are planned to be compiled in order to offer a guideline for renovation scenario(s) in existing building stock. This shall serve as a guideline for building managers, building owners and also for potential energy performance contracting projects.



RECOMMENDED MEASURES

OSNOVNI PODATKI O STAVBI	
Vrsta stavbe	Večstanovanjska stavba
Naslov	Cesta revolucije 011
Ogrevana površina	395 m2
Lastnik	Mešano lastništvo
Etažnost	K+P+3
Leto izgradnje	1967
Leto obnove	-

Predlagani ukrepi z oceno investicijskih stroškov in vračilne dobe

Gradbeni posegi

investicija [000 SIT/obj]	prihranek energije [MWh/leto]	letni prihranek [000 SIT/leto]	vračilna doba [let]
Tesnjenje oken			
139	10	733	2
Menjava oken			
3.480	21	160	22
toplotna izolacija fasade			
3.920	48	365	11
toplotna izolacija podstrešja			
207	10	73	3

Vir: Energetski pregled večstanovansjkih stavb v občini Jesenice, izvajalec Gradbeni inštitut ZRMK, d.o.o., naročnik Občina jesenice

Posegi na strojnih instalacijah

investicija [000 SIT/obj]	prihranek energije [MWh/leto]	zmanjšanje stroškov [000 SIT/leto]	vračilna doba [let]
1. pregled instalacije ogrevanja			
nedol.	-	-	-
nedol.	-	-	-
5. kombinacija ukrepov 2,3,4			
1.082	37	285	3,8
1.082	31	238	4,6
6. vgradnja delilnikov stroškov ogr.			
92	-	-27	-
92	-	-27	-

(prve vrednosti se nanašajo na izvedbo ukrepov brez predhodnih gradbenih posegov, druge pa za primer izvajanja obojih)

Figure 6. Energy saving potential.

3.2.6. Financing and incentives

Sharing actual information on financing opportunities, subsidies, and soft loans is necessary for assisting the successful implementation of measures. A page with relevant links to municipal and national support is planned.

3.2.7. Energy advisory

Energy advisors are one of the important actors, besides municipality, utility, energy managers, designers, architects, installers, building contractors, technology providers and other energy experts that can significantly contribute to successful implementation of the above measures.

Slovenia has more than 13 years of tradition in running of energy advisory network ENSVET, being financed by the state with contributions in kind (municipal office, logistics) from municipalities. The energy advisors are part time employees and responsible for their own promotion of the advisory programme on the municipal level. The municipality Jesenice has its own advisory office:

(http://www.jesenice.si/default.asp?pdr_id=2206&lang_id=1060&obc_id=41),

where the people can ask for the advice according to their need. Mostly the advice is asked by single family house owners, while apartment buildings are difficult to reach. Establishing a link between the potential clients in apartment buildings and the energy advisor can lead to a win-win combination for both, building owners can get a professional free

of charge advice and the energy advisor service can improve its outreach, in difficult to reach (in fact social) housing sector.

EffCoBuild pilot project cover establishment of the link between ENSVET office and the information available at EffCoBuild web site.

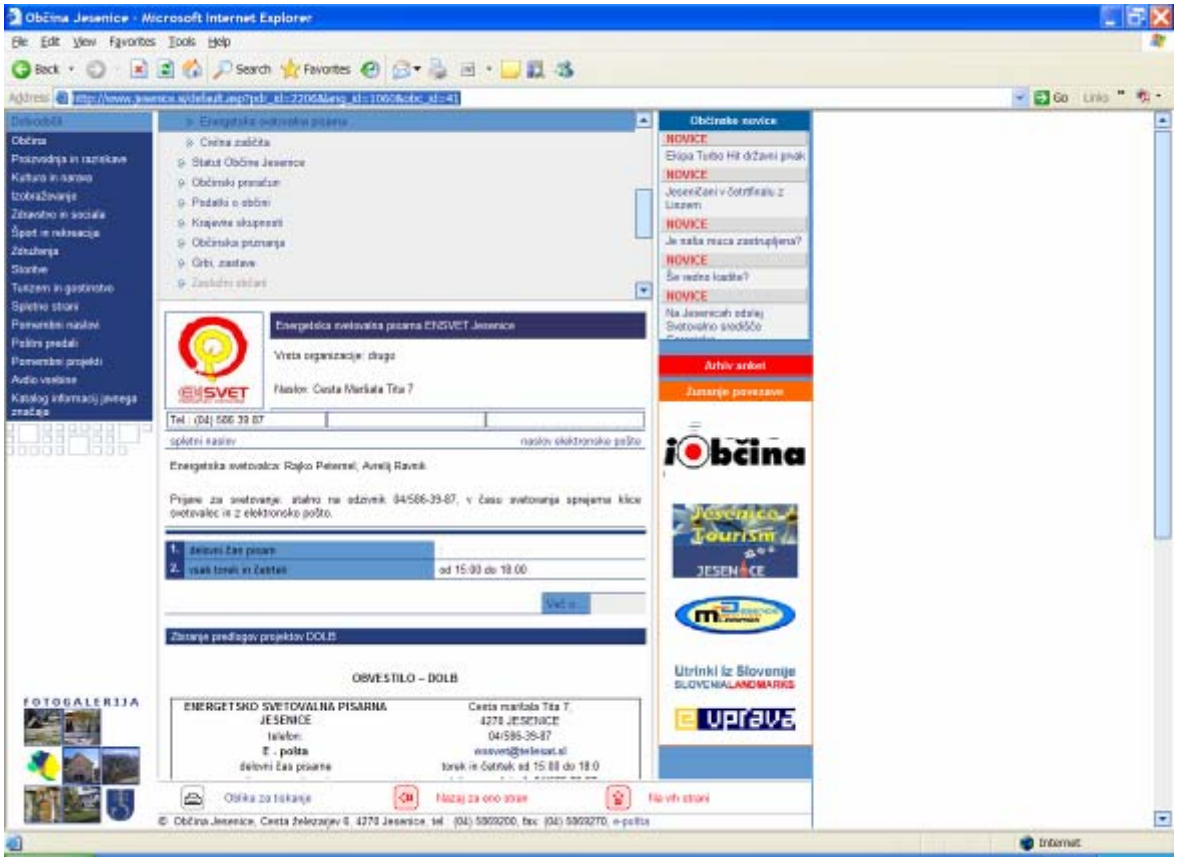


Figure 7. Energy advisory office at Jesenice - link established.

3.3. Best practice cases

Best practice cases in energy restoration in the neighbourhood will be prepared publication in the EffCoBuild brochure in WP5. The idea of this measure is to put 10 best practice cases from EffCoBuild brochure together with the users' opinion about the impact of renovation on the municipal utility home page. The aim of this on-line measure is to disseminate effectively best practice and to stimulate creation of similar projects in the municipality.

Office building / tertiary sector
Borisa Kidriča 37c, Jesenice

- 32% energy savings
- PB 15 years

Year of construction: 1961
Refurbishment: 2000
Heated floor area: 1.656 m2
Delivered energy - BEFORE: 362 MWh/a (219 kWh/m2a)
Delivered energy - AFTER: 247 MWh/a (149 kWh/m2a)
Reduction of CO2 emissions: 38 t / year

Investment: 100.150 €
Investment per m2 floor area: 61 € / m2

Distribution of investment:
38% thermal insulation of outer walls,
42% exchange of windows with EE ones
20% renovation of heating system thermostatic velves

Apartment building
Cesta maršala Tita 4, Jesenice

- 32% energy savings
- PB 15 years

Year of construction: 1960
Refurbishment: 2000
Heated floor area: 448 m2,
after refurbishment 901 m2
Delivered energy - BEFORE: 86 MWh/a (192 kWh/m2a)
Delivered energy - AFTER: 52 MWh/a (58 kWh/m2a)
Reduction of CO2 emissions: 11 t / year

Investment: 33.330 €
Investment per m2 floor area: 75 € / m2

Distribution of investment:
50% thermal insulation of outer walls and roof,
50% exchange of windows with EE ones
Connection do district heating, to existing substation,
Own substation planned for additional 10% savings

Apartment building
Cesta maršala Tita 16, Jesenice

- **40% energy savings**
- **PB 19 years** / total investment

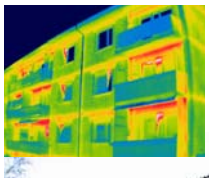
Year of construction: 1966
Refurbishment: 2000
Heated floor area: 1065 m2,
after refurbishment 1412 m2
Delivered energy - BEFORE: 176 MWh/a (165 kWh/m2a)
Delivered energy - AFTER: 121 MWh/a (86 kWh/m2a)
Reduction of CO2 emissions: 18 t / year

Investment: 55.700 €
Thermal insulation wall and roof: 29.500 €
Windows: 26.200 €
Investment per m2 floor area: 39 € / m2
Outer wall contact insulation slab: 16€ / m2 useful floor area

Distribution of investment:
53% thermal insulation of outer walls and roof,
47% exchange of windows with EE ones
Connection to district heating and adequate regulation

Apartment building
Kejžarjeva 38, Jesenice

- **43% energy savings**
- **PB 8,3 years**



Year of construction: 1961
Refurbishment: 2000
Heated floor area: 640 m2,
after refurbishment 1412 m2
Delivered energy - BEFORE: 181 MWh/a (283 kWh/m2a)
Delivered energy - AFTER: 103 MWh/a (161 kWh/m2a)
Reduction of CO2 emissions: 26 t / year

Investment: 37.550 €
Roof insulation 15 cm: 7.300 €
Floor above cellar insulation 5 cm: 6.200 €
Windows: 15.600 €
Renovation of d.h. substation: 8.000 €
Insulation of distribution pipes in cellar: 450 €
Improved living condition
Investment per m2 floor area: 59 € / m2

Distribution of investment:
19% roof thermal insulation, 17% ground floor above cellar,
42% exchange of windows with EE ones

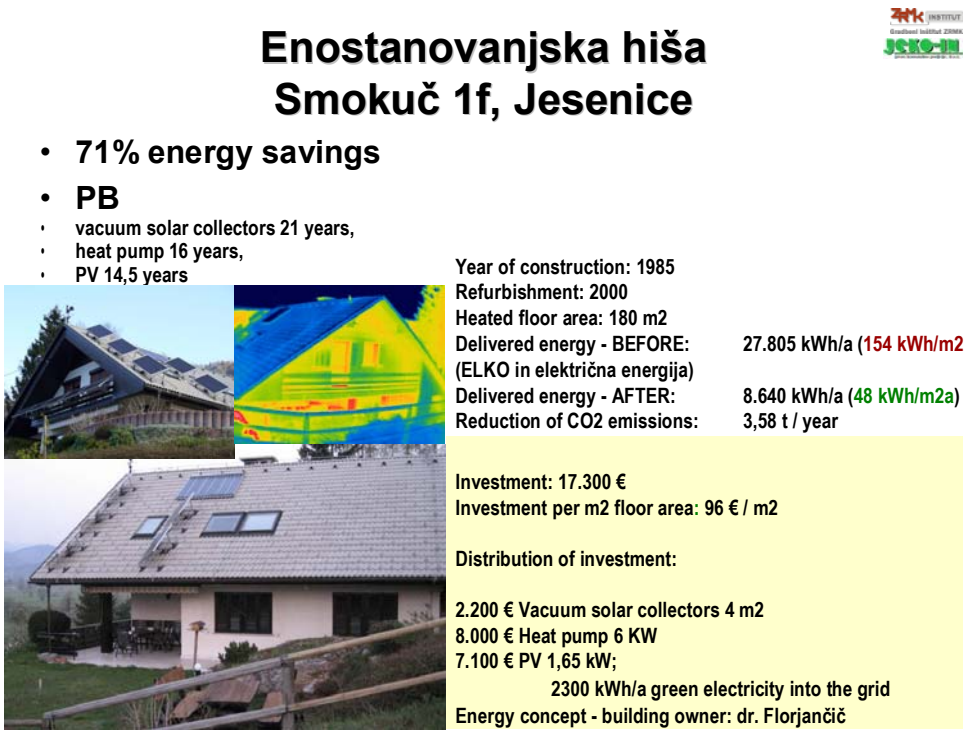


Figure 9: Draft for web – site with the elements of above described measures.

3.4. Links to further information from EIE relevant projects

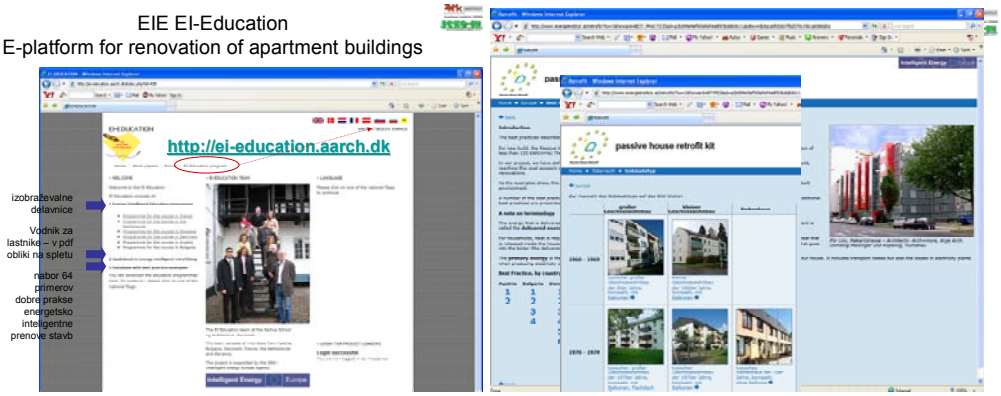
Intelligent Energy Europe project provided a lot of useful information also for Jesenice key actors: building managers, building owners, users of flats in social housing. It was agreed to disseminate this information, together with the tools available in the national language.

- EI-Education – education programmes for social housing sector about how to create and implement EE renovation projects – target: building managers
- Passive Retrofit Kit – technical and financial information on passive hose renovation of existing buildings – target: building owners and building managers
- SHARE – promotion of low cost and organisational measures for reduction of energy consumption and improvement of indoor comfort level (awareness raising and information leaflets)– target: users of flats in social housing

"RUE in over 150 kWh/m² buildings"

- **6 – Links to other information**
  on RES and RUE refurbishment of buildings
- **EIE EI-Education**
  (giudebook and 64 residential refurbishment cases)
  http://ei-education.aarch.dk
- **EIE E-RETROFIT**
  (passive house standard refurbishment cases)
  http://www.energieinstitut.at/retrofit/

EIE EI-Education
E-platform for renovation of apartment buildings



3.5. Dissemination

3.5.1. Dissemination over the energy bills

Utility has a possibility as well as a commitment by the energy act to disseminate the information about energy efficiency to their clients. The measure aims at sending out the information about EffCoBuild results and implemented measures (saving potential, home page with web site benchmarking, best practice cases) over the energy bills.

- A flyer is planned to be integrated in the energy bill, bringing the information about the energy saving potential and the EffCoBuild web-site benchmarking.

3.5.2. Dissemination of web site benchmarking via media

Local and national professional media

- like EGES, JON, Bulletin AURE, Gradim, Gradbenik

will be used for dissemination of EffCoBuild results in order to motivate the local energy users to form renovation projects and to build a follow-up impact in other Slovenian communities.

The media campaign detailed schedule is linked to the completion of the web-site benchmarking tool, expected for Feb 2008. In reported period 2 articles were submitted: the fist one was published,